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REMARKS

Claims 11, 22 and 23 are pending in this application. Claims 1-10 and 12-21 were previously canceled, without prejudice or disclaimer. By this Amendment, claim 11 has been amended to clarify the claimed subject matter. Accordingly, claims 11, 22 and 23 are presented for reconsideration, with claims 11 and 23 being in independent form.

Claim 11, 22 and 23 were rejected under 35 U.S.C. § 103(a) as purportedly unpatentable over U.S. Patent No. 5,764,245 to Yokoi in view of U.S. Patent No. 5,897,961 to Malhotra and U.S. Patent No. 5,670,995 to Kupcho et al.

The present application relates to an ink-jet recording apparatus configured to provide double-sided printing with a high-level of image quality on both sides. Applicant devised an improved an ink-jet recording apparatus configured to provide double-sided printing which includes a containing member containing a recording medium having a base member and granular material coated on both sides of the base member, wherein roughness of the surfaces of the recording medium coated with granular material is smaller than the roughness of the base member, and therefore penetration of ink into the other side (such as typically found in conventional ink-jet recording apparatus for double-sided printing) can be prevented. In addition, the ink-jet recording apparatuses of independent claims 11 and 23 have a memory configured to hold data of one page volume in one chunk that is used for printing image on the back side of the recording medium, a front side of which has been already printed. Each of independent claims 11 and 23 addresses these features, as well as additional features.

Yokoi, as understood by applicant and previously discussed in the record, proposes a recording apparatus which, in order to avoid needing a large capacity buffer, utilizes instead a

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line buffer to receive and temporarily store data from a host computer for a scanning line of the image to be printed.

However, as acknowledged in the Office Action as well as elsewhere in the record, Yokoi does not teach or suggest an ink-jet recording apparatus including (a) a containing member containing a recording medium having a base member and granular material coated on both sides of the base member wherein roughness of the surfaces of the recording medium with coated granular material is smaller than the roughness of the base member, and (b) a memory configured to hold data of one page volume in one chunk that is used for printing image on the back side of the recording medium, a front side of which has been already printed, as provided by the subject matter of claim 11 of the present application.

Malhotra, likewise, does not teach or suggest such an ink-jet recording apparatus.

Malhotra, as understood by applicant, proposes coated photographic papers comprising cellulosic substrate having a thickness between 50 microns to 250 microns, and on which various coating agents can be applied.

However, Malhotra neither teaches nor suggest that such coated photographic papers are suitable for double-sided printing.

According to Malhotra (column 1, lines 61-65), the coated photographic papers proposed therein "can be prepared from papers containing an ink receiving layer on the front side of the paper and a traction promoting pencil or pen writeable coating on the back side, reverse, or opposite side of the ink jet photographic paper". Thus, Malhotra proposes applying various coating agents such that photograph image quality can be obtained from the front side, while improved characteristics for writing with a pencil or a pen can be obtained from the reverse side.

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On the other hand, Malhotra neither teaches nor suggest that the paper can be configured to be suitable for double-side printing with an ink-jet recording apparatus, such as provided by the subject matter of claim 11 of the present application which is configured to overcome a problem that degradation in image quality may occur as a result of ink applied to a front side on of an improvidently provided recording medium penetrating into the reverse side so that the image on the front side also appears on the reverse side.

In order to achieve such a technical result with the subject matter of claim 11 of the present application, a thickness of a base member of the recording medium and an amount of a coating agent provided on both sides of the paper are suitably selected, so that ink on the front side is prevented from penetrating the paper to the reverse side, and thus superior image quality on both sides of the paper can be obtained.

The paper thickness and coating agents proposed by Malhotra are not directed to the object of obtaining image quality on both sides, and the object that ink on the front side should be prevented from penetrating through the paper to the reverse side.

Malhotra, column 6, lines 4-20, which was cited in the Office Action, states as follows:

U.S. Pat. No. 5,567,513 discloses an ink jet recording paper sheet for ink-jet recording with on-demand type heads having a multi-nozzle comprises a recording layer formed on one face of a base paper sheet to give a basis weight of the recording paper of from 150 to 250 g/m² with a coating color which contains a pigment and a binder, the pigment containing synthetic silica having a BET specific surface area ranging from 250 to 500 g/m² at a content of not less than 80 percent by weight of the pigment, the binder containing casein and styrene-butadiene rubber, the weight ratio of the pigment to the binder ranging from 1.8 to 2.4, the recording layer having coating solid in an amount ranging from 15 to 25 g/m², and *surface roughness by ten-point-height of the recording layer ranging from 0.5 to 5 µm*, and the paper sheet being curled at a maximum curling height ranging from 0 to 20 millimeters in A4 paper size with the printed face upside.

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In contrast, in the subject matter of claim 11 of the present application, "roughness of the surfaces of the recording medium coated granular material is smaller than roughness of the base member". Such feature is simply not taught nor suggested by Malhotra.

In addition, Malhotra, like Yokoi, does not teach or suggest an ink-jet recording apparatus configured for double-sided printing, including a memory configured to hold data of one page volume in one chunk that is used for printing image on the back side of the recording medium, a front side of which has been already printed, as provided by the subject matter of claim 11 of the present application.

Kupcho, as understood by applicant, proposes an apparatus for simultaneous double-sided printing.

However, Kupcho, contrary to the contention in the Office Action, does not teach or suggest an ink-jet recording apparatus including a memory configured to hold data of one page volume in one chunk that is used for printing image on the back side of the recording medium, a front side of which has been already printed, as provided by the subject matter of claim 11 of the present application.

In the apparatus proposed by Kupcho, both sides are printed simultaneously. For this purpose, two inkjet heads are provided on respective sides of the paper, each head being provided with its own memory, and, with the use of the memories, printing is made for both sides simultaneously. Thus, the apparatus proposed by Kupcho is clearly different from that of the subject matter of claim 11 of the present application.

According to the subject matter of claim 11 of the present application, after a front side is printed, then a reverse side is printed. That is, "said ink-jet recording apparatus has a memory

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configured to hold data of one page volume in one chunk that is used for printing image on the back side of the recording medium, front side of which has been already printed".

The cited art simply does not teach or suggest an ink-jet recording apparatus including (a) a containing member containing a recording medium having a base member and granular material coated on both sides of the base member, wherein roughness of the surfaces of the recording medium coated granular material is smaller than the roughness of the base member, and (b) a memory configured to hold data of one page volume in one chunk that is used for printing image on the back side of the recording medium, front side of which has been already printed, as provided by the subject matter of claim 11 of the present application. Independent claim 23 is patentably distinct from the cited art for at least similar reasons.

In view of the remarks hereinabove, Applicant submits that the application is now in condition for allowance, and earnestly solicits the allowance of the application.

If a petition for an extension of time is required to make this response timely, this paper should be considered to be such a petition. The Patent Office is hereby authorized to charge any fees that are required in connection with this Amendment, and to credit any overpayment, to our Deposit Account No. 03-3125.

If a telephone interview could advance the prosecution of this application, the Examiner is respectfully requested to call the undersigned attorney.

Respectfully submitted,



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